

CLAIMS

1. A method for optically analyzing microbiological specimens suspended in a fluid medium, comprising the steps of:
 - a. magnetically labeling the microbiological specimens;
 - 5 b. containing the fluid medium in a vessel having a chamber therein for receiving the fluid medium, and having a transparent top member;
 - c. positioning the vessel into a magnetic field having a substantially uniform region of vertically-directed magnetic gradient, such that the chamber is located in the uniform region;
 - 10 d. collecting a uniformly-distributed layer of the magnetically-labeled microbiological specimens on the interior surface of the chamber bounded by the transparent member; and
 - e. conducting optical analysis of the microbiological specimens while maintaining the specimens collected on the interior surface of the chamber bounded by the transparent member.
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2. The method of claim 1, wherein the step of the positioning the vessel comprises positioning the vessel in a gap between a pair of magnets having respective tapered surfaces facing the gap, and wherein the step of conducting optical analysis comprises microscopic observation of the specimens along an observation path extending vertically into the gap between the magnets and into the chamber.
- 20 3. The method of claim 1, comprising the step of providing for adhesion between the specimens and the interior surface of the chamber bounded by the transparent member, in order to inhibit horizontal movement of the specimens collected thereon.
4. An apparatus for observing magnetically responsive microscopic entities suspended in a fluid member, comprising:
 - 25 a. a vessel having a transparent wall and a chamber formed therein for containing the fluid medium;
 - b. a ferromagnetic capture structure supported on the interior surface of the transparent wall;
 - 30 c. magnetic means for inducing an internal magnetic gradient in the vicinity of the ferromagnetic capture structure, whereby the magnetically responsive entities are immobilized along the wall adjacent to the capture structure; and

- d. electrical conductor means supported on the transparent wall for enabling electrical manipulation of the immobilized entities.
5. A method of collecting and observing microbiological specimens in a fluid medium, comprising:
- 5 a. magnetically labeling the specimens by contacting the specimens with a plurality of magnetic labeling particles;
 - b. placing the fluid medium into a vessel having a chamber with a transparent surface and a porous wall;
 - 10 c. applying a magnetic field gradient to the chamber to remove the excess magnetic labeling particles through the porous wall of the chamber while retaining the labeled specimens; and
 - d. attracting the labeled specimens toward the transparent wall for observation after removal of the excess particles.
6. A method for optically analyzing microbiological specimens suspended in a fluid medium, comprising the steps of:
- 15 a. magnetically labeling the microbiological specimens;
 - b. containing the fluid medium in a vessel having a chamber therein for receiving the fluid medium, a transparent top member, and the chamber having two collection regions of differing heights;
 - 20 c. positioning the vessel into a magnetic field having a substantially uniform region of vertically-directed magnetic gradient, such that the chamber is located in the uniform region; and
 - d. collecting magnetically labeled microbiological specimens on respective regions of the interior surface of the transparent top member corresponding to the collection regions of the chamber.
- 25 7. The method of claim 6 comprising the step of providing a barrier between the collection regions of the chamber.